I hereby certify that this correspondence is being deposited with the U.S. Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231 on the date indicated below.

Signature Angela M. Weinstock Date February 6, 2001

Angela M. Weinstock

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of

LINDSEY et al. Group Art Unit: 2731

New Application Examiner: Ngo, R.
Divisional of 08/861,438 filed 5/21/1997
(Allowed 11/7/2000)

Filed: February 6, 2001 Docket No. 100.229

Customer No. 023907

For: METROPOLITAN AREA NETWORK SWITCHING SYSTEM AND METHOD OF OPERATION THEREOF

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, DC 20231

Dear Sir:

Prior to initial examination, please amend the above-identified application as follows:

IN THE SPECIFICATION:

Please amend the specification as follows:

Page 5, before line 1, insert: --This application is a divisional of co-pending U.S. Patent Application Serial No. 08/861,438.--

Page 7, line 11, replace "FIG. 6 illustrates" with --FIGS. 6A, 6B, and 6C illustrate--; and

line 16, replace "FIG. 8 illustrates" with --FIGS. 8A and 8B illustrate--.

Page 8, line 8, replace "FIG. 13 illustrates" with --FIGS. 13A and 13B illustrate--.

Page 20, line 6, replace "FIG. 6" with --FIGS. 6A, 6B, and 6C--.

Page 21, line 15, replace "FIG. 6 illustrates" with --FIGS. 6A, 6B, and 6C illustrate--.

Page 25, lines 6 and 14, replace "FIG. 8" with --FIGS. 8A and 8B--.

Page 25, line 7, replace "FIG. 8 shows" with --FIGS. 8A and 8B show--.

Page 26, lines 5 and 16, replace "FIG. 8" with --FIGS. 8A and 8B--.

Page 27, line 16, replace "FIG. 8" with --FIGS 8A and 8B--.

Page 28, line 21, replace "FIG. 8" with --FIGS. 8A and 8B--.

Page 29, line 11, replace "FIG. 8" with --FIGS. 8A and 8B--.

Page 37, line 12, replace "FIG. 13 illustrates" with --FIGS. 13A and 13B illustrate--.

Page 49, replace Eq. (4) with:

$$\begin{bmatrix} V_1 \\ V_2 \\ V_3 \\ V_4 \end{bmatrix} = \begin{bmatrix} 0100 \\ 0001 \\ 0010 \\ 0100 \end{bmatrix} x \begin{bmatrix} U_1 \\ U_2 \\ U_3 \\ U_4 \end{bmatrix} = \begin{bmatrix} U_2 \\ U_4 \\ U_3 \\ U_2 \end{bmatrix}$$

Page 57, line 20, replace "$U_3^{(m)}$" with --$V_3^{(m)}$--.

IN THE CLAIMS:

Please cancel claims 1-56 without prejudice or disclaimer.

Please add claims 57-112 as follows:

57. A multi-format adaptive plesiochronous network, comprising:

a first router;

a topology adaptive tie-line having a plurality of full duplex dedicated router interconnects connected to said first router, the topology adaptive tie-line transmitting at least non-packetized latency free continuous data;

a second router connected to said plurality of full duplex dedicated router interconnects; and

a user connected to said first router with a full duplex loop.

58. The multi-format adaptive plesiochronous network of claim 57, wherein each of said plurality of full duplex dedicated router interconnects is selected from the group consisting of a single full duplex wave division multiplexer optical fiber, a pair of simplex optical fibers, a single full duplex frequency division multiplexer electrical wire, and a pair of simplex electrical wires.

59. The multi-format adaptive plesiochronous network of claim 57, wherein each of said plurality of full duplex dedicated router interconnects are selected from the group consisting of a looping, point-to-point connection, and a parallel ring connection.

60. The multi-format adaptive plesiochronous network of claim 57, wherein said plurality of full duplex dedicated router interconnects includes a reconfigurable full duplex point-to-point connection which is adapted for passing control network data from the user to another user.

61. The multi-format adaptive plesiochronous network of claim 57, wherein said plurality of full duplex dedicated router interconnects includes a permanent full duplex looping point to point connection which is adapted for passing control network data from the user to another user.

62. The multi-format adaptive plesiochronous network of claim 57, wherein the user includes:

I) a signal transmitting system for transmittal of a serialized signal including (A) latency free continuous data, and (B) at least one member selected from the group consisting of bursty data and packetized data, said signal transmitting system including a multiplexer and a timing control block; and

II) a signal receiving system for reception of said signal without disrupting the laminarity of the latency free continuous data, said signal receiving system including a demultiplexer and a sequence detector,

so as to establish full duplex communications between the user and another user on one of said plurality of full duplex dedicated router interconnects.

63. The multi-format adaptive plesiochronous network of claim 62, wherein said multiplexer includes a structure which simultaneously transfers of base band latency free continuous real-time multimedia data.

64. The multi-format adaptive plesiochronous network of claim 62, wherein said multiplexer includes a time division multiplexer and at least one of said plurality of full duplex dedicated router interconnects is selected from the group consisting of a single full duplex wave division multiplexer optical fiber and a pair of simplex optical fibers.

65. The multi-format adaptive plesiochronous network of claim 60, wherein said multiplexer includes a multiplexer network access port which is adapted for simultaneous (I) full duplex messaging between the user and the another user and (II) management of said network including dynamic reallocation of network resources, said multiplexer network access port being selected from the group consisting of structure for asynchronous data communication and structure for packetized data communication.

66. The multi-format adaptive plesiochronous network of claim 65, wherein said multiplexer network access port is selected from the group consisting of an RS232 with full hand shake port, an RS422 port, an RS485 port, a SCSI port and a full duplex 10Mb/sec packetized data port.

67. The multi-format adaptive plesiochronous network of claim 60, wherein (I) said multiplexer includes a clock multiplier, an encoder, a framer and a parallel to serial convertor, and (II) the user and includes an analog-to digital converter, a first-in-first-out memory buffer having an almost empty flag, a digital to analog convertor, a counter register and a latch.

68. The multi-format adaptive plesiochronous network of claim 57, wherein the user includes a switch for dropping and adding signals.

69. The multi-format adaptive plesiochronous network of claim 57, wherein the user includes a 1:2 bypass switch for redundant switching.

70. The multi-format adaptive plesiochronous network of claim 57, wherein there are n users, N lines, where $N < n$, and the system is quasi-latency free such that there is no contention at least part of the time.

71. An apparatus, comprising a network, said network including:

a first router;

a tie-line having a plurality of full duplex dedicated router interconnects connected to said first router, the tie line transmitting at least non-packetized latency free continuous data;

a second router connected to said plurality of full duplex dedicated router interconnects; and

a user connected to said first router with a full duplex loop.

72. The apparatus of claim 71, wherein each of said plurality of full duplex dedicated router interconnects is selected from the group consisting of a single full duplex wave division multiplexer optical fiber, a pair of simplex optical fibers, a single full duplex frequency division multiplexer electrical wire, and a pair of simplex electrical wires.

73. The apparatus of claim 71, wherein each of said plurality of full duplex dedicated router interconnects are selected from the group consisting of a looping, point-to-point connection, and a parallel ring connection.

74. The apparatus of claim 71, wherein said plurality of full duplex dedicated router interconnects includes a reconfigurable full duplex point-to-point connection which is adapted for passing control network data from the user to another user.

75. The apparatus of claim 71, wherein said plurality of full duplex dedicated router interconnects includes a permanent full duplex looping point to point connection which is adapted for passing control network data from the user to another user.

76. The apparatus of claim 71, wherein the user includes:

I) a signal transmitting system for transmittal of a serialized signal including (A) latency free continuous data, and (B) at least one member selected from the group consisting of bursty data and packetized data, said signal transmitting system including a multiplexer and a timing control block; and

II) a signal receiving system for reception of said signal without disrupting the laminarity of the latency free continuous data, said signal receiving system including a demultiplexer and a sequence detector,

so as to establish full duplex communications between the user and another user on one of said plurality of full duplex dedicated router interconnects.

77. The apparatus of claim 76, wherein said multiplexer includes a structure which simultaneously transfers of base band latency free continuous real-time multimedia data.

78. The apparatus of claim 76, wherein said multiplexer includes a time division multiplexer and at least one of said plurality of full duplex dedicated router interconnects is selected from the group consisting of a single full duplex wave division multiplexer optical fiber and a pair of simplex optical fibers.

79. The apparatus of claim 74, wherein said multiplexer includes a multiplexer network access port which is adapted for simultaneous (I) full duplex messaging between the user and the another user and (II) management of said network including dynamic reallocation of network resources, said multiplexer network access port being selected from the group consisting of structure for asynchronous data communication and structure for packetized data communication.

80. The apparatus of claim 79, wherein said multiplexer network access port is selected from the group consisting of an RS232 with full hand shake port, an RS422 port, an RS485 port, a SCSI port and a full duplex 10Mb/sec packetized data port.

81. The apparatus of claim 74, wherein (I) said multiplexer includes a clock multiplier, an encoder, a framer and a parallel to serial convertor, and (II) the user includes an analog-to digital converter, a first-in-first-out memory buffer having an almost empty flag, a digital to analog convertor, a counter register and a latch.

82. The apparatus of claim 71, wherein the user includes a switch for dropping and adding signals.

83. The apparatus of claim 71, wherein the user includes a 1:2 bypass switch for redundant switching.

84. The apparatus of claim 71, wherein there are n users, N lines, where $N < n$, and the system is quasi-latency free such that there is no contention at least part of the time.

85. A multi-format adaptive plesiochronous network, comprising:

a first router;

a topology adaptive tie-line having a plurality of full duplex dedicated router interconnects connected to said first router, the topology adaptive tie-line transmitting at least latency free

continuous data, the topology adaptive tie-line also transmitting router reconfiguration data multiplexed with the latency free continuous data;

a second router connected to said plurality of full duplex dedicated router interconnects; and

a user connected to said first router with a full duplex loop.

86. The multi-format adaptive plesiochronous network of claim 85, wherein each of said plurality of full duplex dedicated router interconnects is selected from the group consisting of a single full duplex wave division multiplexer optical fiber, a pair of simplex optical fibers, a single full duplex frequency division multiplexer electrical wire, and a pair of simplex electrical wires.

87. The multi-format adaptive plesiochronous network of claim 85, wherein each of said plurality of full duplex dedicated router interconnects are selected from the group consisting of a looping, point-to-point connection, and a parallel ring connection.

88. The multi-format adaptive plesiochronous network of claim 85, wherein said plurality of full duplex dedicated router interconnects includes a reconfigurable full duplex point-to-point connection which is adapted for passing control network data from the user to another user.

89. The multi-format adaptive plesiochronous network of claim 85, wherein said plurality of full duplex dedicated router interconnects includes a permanent full duplex looping point to point connection which is adapted for passing control network data from the user to another user.

90. The multi-format adaptive plesiochronous network of claim 85, wherein the user includes:

I) a signal transmitting system for transmittal of a serialized signal including (A) latency free continuous data, and (B) at least one member selected from the group consisting of bursty data and packetized data, said signal transmitting system including a multiplexer and a timing control block; and

II) a signal receiving system for reception of said signal without disrupting the laminarity of the latency free continuous data, said signal receiving system including a demultiplexer and a sequence detector,

so as to establish full duplex communications between the user and another user on one of said plurality of full duplex dedicated router interconnects.

91. The multi-format adaptive plesiochronous network of claim 90, wherein said multiplexer includes a structure which simultaneously transfers of base band latency free continuous real-time multimedia data.

92. The multi-format adaptive plesiochronous network of claim 90, wherein said multiplexer includes a time division multiplexer and at least one of said plurality of full duplex dedicated router interconnects is selected from the group consisting of a single full duplex wave division multiplexer optical fiber and a pair of simplex optical fibers.

93. The multi-format adaptive plesiochronous network of claim 88, wherein said multiplexer includes a multiplexer network access port which is adapted for simultaneous (I) full duplex messaging between the user and the another user and (II) management of said network including dynamic reallocation of network resources, said multiplexer network access port being selected from the group consisting of structure for asynchronous data communication and structure for packetized data communication.

94. The multi-format adaptive plesiochronous network of claim 93, wherein said multiplexer network access port is selected from the group consisting of an RS232 with full hand shake port, an RS422 port, an RS485 port, a SCSI port and a full duplex 10Mb/sec packetized data port.

95. The multi-format adaptive plesiochronous network of claim 88, wherein (I) said multiplexer includes a clock multiplier, an encoder, a framer and a parallel to serial convertor, and (II) both the user and the another user include an analog-to digital converter, a first-in-first-out memory buffer having an almost empty flag, a digital to analog convertor, a counter register and a latch.

96. The multi-format adaptive plesiochronous network of claim 85, wherein the user includes a switch for dropping and adding signals.

97. The multi-format adaptive plesiochronous network of claim 85, wherein the user includes a 1:2 bypass switch for redundant switching.

98. The multi-format adaptive plesiochronous network of claim 85, wherein there are n users, N lines, where $N < n$, and the system is quasi-latency free such that there is no contention at least part of the time.

99. An apparatus, comprising a network, said network including:

a first router;

a tie-line having a plurality of full duplex dedicated router interconnects connected to said first router, the tie line transmitting router reconfiguration data multiplexed with latency free continuous data;

a second router connected to said plurality of full duplex dedicated router interconnects; and

a user connected to said first router with a full duplex loop.

100. The apparatus of claim 99, wherein each of said plurality of full duplex dedicated router interconnects is selected from the group consisting of a single full duplex wave division multiplexer optical fiber, a pair of simplex optical fibers, a single full duplex frequency division multiplexer electrical wire, and a pair of simplex electrical wires.

101. The apparatus of claim 99, wherein each of said plurality of full duplex dedicated router interconnects are selected from the group consisting of a looping, point-to-point connection, and a parallel ring connection.

102. The apparatus of claim 99, wherein said plurality of full duplex dedicated router interconnects includes a reconfigurable full duplex point-to-point connection which is adapted for passing control network data from the user to another user.

103. The apparatus of claim 99, wherein said plurality of full duplex dedicated router interconnects includes a permanent full duplex looping point to point connection which is adapted for passing control network data from the user to another user.

104. The apparatus of claim 99, wherein the user includes:

I) a signal transmitting system for transmittal of a serialized signal including (A) latency free continuous data, and (B) at least one member selected from the group consisting of

bursty data and packetized data, said signal transmitting system including a multiplexer and a timing control block; and

II) a signal receiving system for reception of said signal without disrupting the laminarity of the latency free continuous data, said signal receiving system including a demultiplexer and a sequence detector,

so as to establish full duplex communications between the user and another user on one of said plurality of full duplex dedicated router interconnects.

105. The apparatus of claim 104, wherein said multiplexer includes a structure which simultaneously transfers of base band latency free continuous real-time multimedia data.

106. The apparatus of claim 104, wherein said multiplexer includes a time division multiplexer and at least one of said plurality of full duplex dedicated router interconnects is selected from the group consisting of a single full duplex wave division multiplexer optical fiber and a pair of simplex optical fibers.

107. The apparatus of claim 102, wherein said multiplexer includes a multiplexer network access port which is adapted for simultaneous (I) full duplex messaging between the user and the another user and (II) management of said network including dynamic reallocation of network resources, said multiplexer network access port being selected from the group consisting of structure for asynchronous data communication and structure for packetized data communication.

108. The apparatus of claim 107, wherein said multiplexer network access port is selected from the group consisting of an RS232 with full hand shake port, an RS422 port, an RS485 port, a SCSI port and a full duplex 10Mb/sec packetized data port.

109. The apparatus of claim 102, wherein (I) said multiplexer includes a clock multiplier, an encoder, a framer and a parallel to serial convertor, and (II) the user includes an analog-to digital converter, a first-in-first-out memory buffer having an almost empty flag, a digital to analog convertor, a counter register and a latch.

110. The apparatus of claim 99, wherein the user includes a switch for dropping and adding signals.

111. The apparatus of claim 99, wherein the user includes a 1:2 bypass switch for redundant switching.

112. The apparatus of claim 99, wherein there are n users, N lines, where N < n, and the system is quasi-latency free such that there is no contention at least part of the time.

REMARKS

Claims 57-112 are pending in this application. By this Amendment, claims 57-112 added and claims 1-56 are cancelled without prejudice or disclaimer. Claims 57-112 are added to incorporate the subject matter of restricted claims 15-36 and 51-56 of parent U.S. Patent Application Serial No. 08/861,438. Reconsideration in view of the above amendments and the following remarks is respectfully requested.

Applicants gratefully acknowledge the Office Action's indication of allowable subject matter in claims 6-11 and 42-47 in related U.S. Patent Application Ser. No. 08/861,438 which are similar to claims 62-67, 76-81, 90-95, and 140-109 in the present application while incorporating elements from claim 15-36 and 51-56. However, for the reasons set forth below, Applicants respectfully assert that all of the claims are directed to allowable subject matter and that the application is in condition for allowance.

Applicants thank Examiner Ngo for the courtesies extended to Applicant's representative during the September 14, 2000 personal interview and the October 23, 2000 telephonic interview for related U.S. Patent Application Serial No. 08/861, 438. During the interviews, the differences between amended claims 1 and 37, now claims 57, 71, 85, and 99, and Jurkevich et al. (U.S. Patent No. 5,164,398) and Fujisaki (U.S. Patent No. 5,903,569) were discussed. Examiner Ngo agreed that the amended claims are not taught or suggested by Jurkevich et al. or Fujisaki, but stated that they would require further consideration or search (as noted in the September 14, 2000 interview summary). The substance of the interview is summarized in the following remarks.

The May 24, 2000 Office Action rejected claims 1-14 and 37-50 under 35 U.S.C. § 102 over Jurkevich et al. (U.S. Patent No. 5,164,938) or Fujisaki (U.S. Patent No. 5,903,569). This rejection is respectfully traversed.

Jurkevich et al. discloses a system that utilizes a composite frame approach for fast packet multimedia that utilizes frame compression and bandwidth seizing (col. 3, lines 3-9). Frames may be compressed to conserve bandwidth rather than employing techniques of contention for available bandwidth (col. 3, lines 20-22). All of the various traffic component

types in the data streams from multiple subscribers are assembled into composite frames configured for transmission to other subscriber through an integrated services network (col. 3, lines 46-50). The system includes assigning of priorities so that voice traffic may be allowed to suffer data loss but no delays, while data packets are permitted to suffer delay but no data loss (col. 4, lines 23-27).

Fujisaki discloses an apparatus for transmitting and receiving a digital signal, where different types of video and audio signals can be transmitted as one bit stream (col. 2, lines 45-48). The apparatus can transmit a signal that constitutes various data portions (col. 2, lines 49-61). The apparatus utilizes an arrangement of a digital signal reception device and a digital signal transmission device that can be combined together (col. 4, lines 48-50). The digital signal transmission and reception device includes a digital signal transmission device (col. 10, lines 25-27).

Neither Jurkevich et al. nor Fujisaki disclose or suggest a topology adaptive tie-line having a plurality of full duplex dedicated router interconnects connected to a first router, the topology adaptive tie-line transmitting at least non-packetized latency free continuous data, as recited in independent claim 57 and similarly recited in independent claim 71. Additionally, neither Jurkevich et al. nor Fujisaki disclose or suggest the topology adaptive tie line transmitting router reconfiguration data multiplexed with latency free continuous data, as recited in claim 85 and similarly recited in claim 99.

Therefore, Applicants respectfully submit that independent claims 57, 71, 85, and 99 define patentable subject matter. Claims 58-70, 72-84, 86-98, and 100-112 depend from independent claims 57, 71, 85, and 99, respectively, and therefore also define patentable subject

matter. Accordingly, Applicants respectfully request prompt examination and allowance of the pending claims.

Should the Examiner believe that anything further would be desirable in order to place this application in better condition for allowance, the Examiner is invited to contact Applicants' undersigned representative at the telephone number listed below.

Respectfully submitted,

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